

The patent to Scott relates to an aerosol-type container tank having a liquid to be vaporized or atomized in order that a cold fog can be produced. A color may be added to the liquid being vaporized to produce a color residue. However, the atomized liquid to which the color is added will quickly condense which requires that a continuous supply of fog be fed through the system under test. Consequently, the teachings of Scott are only applicable to finding relatively large leaks in systems that are not adapted to be sealed, such as vented sewers, so that a supply of fog can be continuously added and purged from the system.

What is even more, the technique of Scott could not be used to find very small leaks in a closed fluid system, such as a fuel vapor recovery system or an air brake system like that disclosed by the applicants. The atomized fog of Scott would almost instantly condensed if it were introduced into a closed system and, with the low pressure in such an open (sewer) system, there would be no fog at the site of a very small (e.g. .005 inches) leak and, therefore, no color deposited around the leak. Simply put, the vaporized fog of Scott is not at all applicable to finding very small leaks in a closed fluid system of the kind wherein a working gas or liquid is to be transported under pressure.

Dyes have long been used as markers in many different (e.g. medical) fields. In general, it is a relatively simple concept to mix a color with a liquid, atomize the mixture and then deliver the atomized mixture to a system under test. However, the central issue to be decided here is whether one of reasonable skill in the art in which the applicants' invention relates would think or be motivated to combine the teachings of Scott with the applicants' earlier invention as described in Pieroni et al.

In this regard, it is pointed out that the environment of Pieroni et al is altogether different from the environment of Scott. As opposed to a simple atomizing procedure, the applicants' invention requires that a dye first be bonded to a smoke producing solution and then resist destruction as the mixture is heated and vaporized by a heating element. In addition, the smoke carrying dye must be capable of being carried for long distances and/or being introduced into a closed system of the kind within which a working gas or liquid can be transported under pressure. Unlike the cold fog of Scott, the applicants' smoke and dye marker combination will not immediately condense but will remain suspended for as much as 15-20 minutes in order to allow the smoke to reach a leak and leave a deposit of dye at the exist (i.e. leakage) point.

Inasmuch as atomizing (as taught by Scott) is opposite the applicants' method of vaporization (i.e. in which atomizing and condensing the smoke producing solution must be avoided) and inasmuch as the method taught by Scott is not at all applicable to locating small leaks in a closed fluid system (as otherwise accomplished by the applicants), there is absolutely nothing to suggest, other than impermissible hindsight, that one skilled in the art would refer to Scott or be inclined or think to combine the teachings of Scott with Pieroni et al when it is recognized that Scott and Pieroni et al are based on entirely different technologies in entirely different environments.

To this end, independent claim 1 has been amended to more clearly describe the environment in which the applicants' method is applicable. Although Scott describes a dye marker to be used in detecting a leak, because of the totally different environment and application

of the system described by Pieroni et al relative to the method described by Scott, it is submitted that one of reasonable skill in the art to which the applicants' claimed invention relates would not be so taught or motivated to combine the teachings of Scott with Pieroni et al to achieve the method recited by the applicants in independent claim 1, amended. Accordingly, independent claim 1, amended, is believed to be patentable over the Examiner's combination of Pieroni et al in view of Scott. Inasmuch as independent claim 1, amended, is believed to be patentable, claims 2-10, which depend therefrom, are likewise believed to be patentable.

Claim 9 is rejected under 35 U.S.C. 103 as being unpatentable over the aforementioned patent to Pieroni et al as modified by the aforementioned patent to Scott in further view of the patents to Gorge and Brayman et al. Claim 9 is dependent from independent claim 1. Inasmuch as independent claim 1, amended, is believed to be patentable, claim 9 is likewise believed to be patentable.

Independent claim 11 is recited for the first time. Independent claim 11 includes a method for detecting leaks in a fluid system including the steps of adding a fluorescent dye to a supply of oil and blowing at least some of said mixture of dye and oil towards a heating element by means of a non-combustible nitrogen gas. No single patent or any combination of patents which are currently of record herein teaches a method which is the same as or equivalent to the applicants' method as recited in independent claim 11. More particularly, the Examiner has pointed out that the aforementioned patent to Brayman et al teaches a trace gas concentration wherein the carrier gas can be nitrogen. However, it is important to understand that the nitrogen gas claimed by the applicant is not employed as a trace gas. The nitrogen gas claimed by the applicants is used for

the entirely different purpose of blowing the mixture of oil and dye towards the heating element at which said mixture is vaporized. Thus, the nitrogen gas plays no role as a trace and, therefore, there is no requirement for nitrogen gas detection in the applicants' method. In this same regard, the applicants' earlier patent to Pieroni et al used air as the gas for blowing the mixture of oil and dye towards the heating element. As will be understood by those skilled in the art, air contains oxygen and is highly combustible in a volatile environment. On the other hand, nitrogen gas is inert and contains no oxygen and is otherwise non-combustible. Accordingly, there is nothing in Pieroni et al, Brayman et al, or any other patent of record which remotely teaches the use of non-combustible nitrogen gas to blow a mixture of dye and oil against a heating element at which the mixture is vaporized into smoke in the manner recited by newly presented independent claim 11. Accordingly, it is submitted that independent claim 11 is patentable over all of the patents of record herein.

It view of the foregoing, each of claims 1-11, which appears in this application, is believed to recite a patentable method. Therefore, reconsideration of the Examiner's rejection is requested and a Notice of Allowance is earnestly solicited.

Respectfully submitted,



Morland C. Fischer
Attorney for the Applicant
2030 Main Street, Suite 1050
Irvine, CA 92614
(949) 476-0600 telephone
(949) 476-0606 facsimile

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